Final
Annual Facilities Operation Plan
19 February, 1999

I. Purpose

The purpose of the Annual Facilities Operation Plan is to anticipate the annual activities expected at each of the facilities during the current Fiscal Year. It identifies current fish on hand and expected production in the next year. In part, this plan is based on the Genetics Management Plan and approved stocking plans. The Genetics Management Plan discusses the relation of propagation to the Recovery Program, reasons for propagation of endangered fishes, Recovery Program philosophy and goals regarding genetics conservation, identified stocks, species priorities. The current stocking plans that have been accepted by the Program are for bonytail (Lentsch et al. 1996) and endangered species of the State of Colorado (Nesler 1998).

II. General Background of Propagation Facilities for Upper Basin

Immediate and short-term needs for endangered fish and propagation facilities were identified by the Recovery Program participants (Wydoski 1994a); long term needs are being developed and a Facility Needs Plan should be available in 1999. Propagation facility needs fall into three major categories (Wydoski 1995b) that include primary refuges, backup refuges, and growout ponds. Table 1 summarizes the functions of each of the facilities and fish on hand.

A. Primary Refuges. Primary refuges are intended for developing and maintaining broodstocks and for production of endangered fish for research experiments as well as augmentation and restoration activities. The propagation facilities at these refuges should be able to rear pedigreed family lots of fish. Three primary refuges are identified for broodstock development. The Ouray National Fish Hatchery is used for Green River razorback sucker broodstock and grow out. The Grand Valley Endangered Fish Facility (24 Road Hatchery Building and Horsethief State Wildlife Area ponds) is used for Upper Colorado River razorback sucker broodstock and grow out, as well as grow out of Colorado pikeminnow. The Wahweap State Fish Hatchery is used for bonytail broodstock and gorw out; and as a backup broodstock for razorback sucker and grow out for both the Green and upper Colorado rivers. The species priorities have been identified in the Genetics Management Plan in the following order: razorback sucker, bonytail, Colorado pikeminnow and humpback chub.

B. Backup Refuges. Backup refuges are intended to maintain priority endangered fishes to prevent catastrophic loss, backup broodstock fish, and fish for long-term research experiments. Currently Wahweap serves as a backup for razorback sucker for both the Green and upper Colorado river stocks. The most cost-effective solution for a backup refuge is simply to maintain the fish in ponds with a reliable water supply in a secure area. Such ponds should have a sloped bottom and a fish trap at the outlet to

provide easy access to the fish. Other stocks are consider the Green and upper Colorado rivers serve as the backup refugia to other species and stocks.

C. Growout or Production Ponds. Excellent growth of razorback suckers, bonytail, and Colorado squawfish was realized from predator-free off-channel lagoons or impoundments in the lower basin (Mueller et al. 1993; Mueller 1995a) and in riverside ponds of the upper basin (Osmundson 1986; Osmundson and Kaeding 1989). Endangered fish that are propagated in natural ponds should more closely exhibit wild fish behavior in feeding or predator avoidance and should have better survival after being stocked into the upper basin. Therefore, growout ponds is the preferred option for rearing endangered fish to be stocked into upper basin waters. The actual area of growout ponds needed will be determined once long term stocking plans have been finalized for all river reaches.

Table 1. Summary of current location of the primary and backup refugia populations and the number of individuals or lots (indicated by parentheses) being held for each of the presumptive genetic stocks. River under primary refuge indicates a temporary status until these populations, if determined necessary, can be secured at a facility; NNI = No Need Identified.

		Refugia		Brood		Production
Species	Stocks	Primary	Backup	Primary	Backup	
Razorback sucker	Middle Green River	Ouray	Wahweap	10407 (23)	2540 (3)	
	Lower Green River	River	NNI		0	
	Colorado River	Horsethief	Wahweap	215 adlt 315 juv.		@ 22000
Bonytail	Upper Basin	Dexter	Wahweap		736	36000
Humpback chub	Blackrocks	Horsethief	River	8		
Colorado pikeminnow	Upper Colorado River	Horsethief	Dexter	85	@450 (17)	

III. Propagation Policy/Process for 1999:

1) Wahweap State Fish Hatchery to serve as the backup refugia for middle Green River razorback sucker stock.
2) Stock razorback sucker excess broodstock into the river (from Ouray and Wahweap).
3) Expand the role of Wahweap hatchery to include broodstock development and production of bonytail.
4) Stream side spawn Colorado pikeminnow in June/July for stocking in 1-2 years according to Nesler's (1998) plan.
5) Get 20,000 Lake Mohave larvae for grow out and back up for meeting the 25 mated pairs design on the Green and Colorado rivers. If the Program is unable to meet the 25 single mated pairs for broodstock of middle Green River razorback sucker by

2001, it will be necessary to use Lake Mohave fish to maintain the genetic integrity of the program.

1999 ACTIVITIES

Ouray National Fish Hatchery

The mission of the Ouray National Fish Hatchery is a primary refuge for priority endangered fishes from Green River stocks. The main purposes for this refuge are (1) to develop broodstocks through pedigreed matings of wild stocks used as founders, (2) to produce fish for crucial field experiments, and (3) to maintain other priority endangered fish for the RIP. Ouray has a hatchery building water treatment building and 10.8 acres of ponds on site. The primary stock being secured at ONFH is the razorback sucker from the middle green, listed in Table 2. The 25x25 spawning matrix is depicted in Table 3.

Table 2. Current Fish on Hand

Species	Year Class	Life Stage	Sex	Fish Stock	Number	Purpose
RBS	89, 90, 91			Green River	72	Future broodstock
RBS	1991			Green River	36	Research: Chemo[1]
RBS	1993			Green River	698	Future broodstock
RBS	1994			Green River	157	Future broodstock
RBS	1995			Green River	247	Future broodstock
RBS	1996			Green River	5	Future broodstock
RBS	1997			Green River	1031	Future broodstock
RBS	1998			Green River	8171	Future broodstock

[1] Identified for a research project.

Table 3. Current spawning matrix of razorback sucker at Ouray National Fish Hatchery. The bold lots are identified for use in the 25x25 crosses, the others are from the crosses which produced half-sibs or were part of the 5x5 diallele cross which has since been discontinued.

		Males												
	Male	220	94D	D02	C33	E43	02A	767	F2E	145	B5E	D05		Year
05E		76	**76**	76	76	76	76							1993
97A		76	37	19	**57**	17	20	6						1993
Females C79						**157**								1994
B42							**167**							1995
86F		**80**												1995
06B									**375**			213		1997
258										**350**	93			1997
F0A	F23												**189**	1998
E19	361												**369**	1998
623	268												**7613**	1998

1999 Plan

1. Develop up to 12 lots according to the approved methods.
2. Move backup broodstock to Wahweap.
3. Stock excess razorback sucker brood fish to river.
4. Stock excess chemoreception fish to river.
5. Move 623x268 excess to Wahweap for grow out and fall stocking.

Grand Valley National Endangered Fish Facility

The mission of the Grand Valley Endangered Fish Facility is a primary refuge for priority endangered fish stocks from the upper Colorado River . The broodstocks for upper Colorado River razorback suckers and Upper Colorado River Colorado squawfish are currently being maintained at the Horsethief ponds. The Grand Valley Endangered Fish Facility is composed of ponds at the Horsethief State Wildlife Area, a hatchery building in Grand Junction, and growout pond along the Upper Colorado River. The Horsethief State Wildlife Area CO contains 6 ponds that total 3.5 surface acres. Clymers pond (5.0 acres) at the confluence of the Gunnison with the Colorado rivers, has served as a growout pond for razorback sucker prior to stocking in the Gunnison River. The current fish on hand at the Grand Valley Fish Facilicity are shown in Tables 4 and 5.

Table 4. Horsethief Refugia Ponds Inventory

Species	Number of Fish	Year Class	Origins
Razorback suckers	8		Old Colorado River Broodstock
	6		Green River Broodstock
	30	1991	Green River F1
	122	1992	Colorado River F1
	49	1994	Colorado River F1
	15	1995	Green River F1
	264	1995	Colorado River F1
	5	1996	Colorado River F1 and F2
	30	1997	Colorado River F1 and F2
Total RBS	529		
Colorado squawfish	85	1991	Colorado River F1
Humpback chub	8	1997	Spawned naturally at Horsethief from wild fish held at Horsethief F1. Going to Ocean's Journey Aquarium, Denver
Total # of Fish	622		

Table 5. 24 Road Hatchery Inventory

All Razorback suckers Lot #	Number of Fish
97 Broodstock	46
9801	1950
9802	575
9803	3900
9804	3100
9805	850
9806	1700
9808	100
9809	4500
9810	140
9811	20
9812	5300
9813	40
9814	80
9815	90
Total	22345

1999 Plan

1. Make F2 crosses for razorback sucker production for Nesler's plan.
2. Stock razorback suckers according to Burdicks/Nesler's in Gunnison River
3. Stream side spawn Colorado pikeminnow for production and stocking.

Wahweap State Fish Hatchery

The mission of the Wahweap State Fish Hatchery is a backup refuge to the Grand Valley Endangered Fish Facility, backup broodstock for middle Green River razorback sucker, bonytail broodstock development and as a production site to rear endangered fish to a desired size before their release into upper basin rivers. Five ponds (approximately 0.35-acre each) are available at Wahweap with 12 (0.4 acre) ponds to be on site in 1999. Bonytail will be reared at Wahweap for the experimental reintroduction stocking effort. Current fish on hand at Wahweap are shown in Table 6.

Table 6. Current Fish on Hand

Species	**Year Class**	**Number**	**Purpose**
Bonytail	1998	36000	Stocking
	1997	520	Brood
	1996	216	Brood
Razorback sucker	1998	2400	

1995	100	Backup Brood
1991	40	Backup Brood

1999 Plan

1. Stock 1998 bonytail and excess broodstock.
2. The development of bonytail broodstock
3. Obtain up to 70,000 bonytail fry from Dexter National Fish Hatchery for stocking needs and broodstock development.
4. Grow out 20,000 bonytail for stocking in the fall at Green River and Professor Valley, UT.
5. Grow out 50,000 for meeting CDOW's plan.